web of data
web of people
web of action

Alan Dix
Lancaster University
and Talis

www.hcibook.com/alan/papers/JWS-2010-world-of-action

about me

I work at Lancaster
near the Lake District

and Birmingham in
the Midlands of England

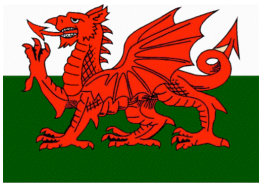
… but

although I speak English

I am not English

I am **Welsh**

rydw i'n Cymraeg



… and live …

in Tiree, Scotland

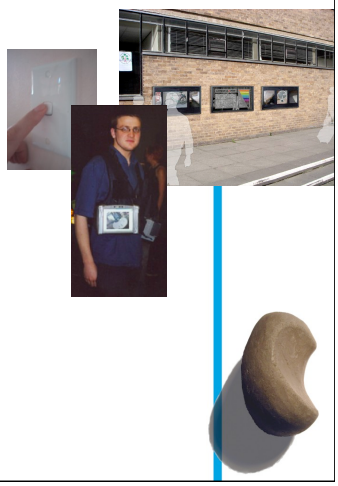
… the sunniest

… and windiest

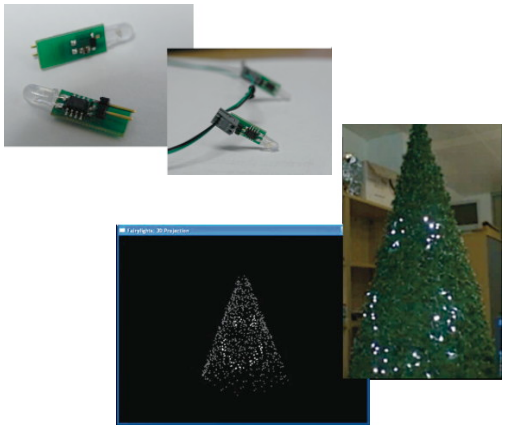
place in the UK

today I am not talking about …

- situated displays, eCampus, small device – large display interactions
- visualisation and sampling
- fun and games, virtual crackers, artistic performance, slow time
- physicality and product design
- creativity and bad ideas and modelling dreams and regret!



… or even lots of lights



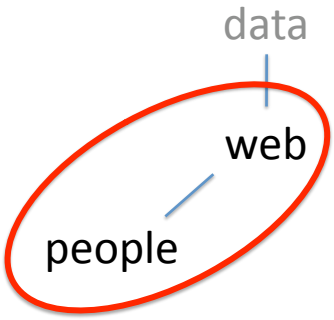
http:/www.hcibook.com/alan/projects/firefly/

... but I am talking about

the web

data | web

- HTML, images, PDF
- hypertext links
- web search



- web 2.0
- social media
- social networking

vfridge (dot.com)
photolurking

vfridge ... looking to the web future ... in 1999

in the midst of dot.com years ...

dominant view:

- expecting 'shake out'
- small number of large players
- future of web as TV-style broadcast medium

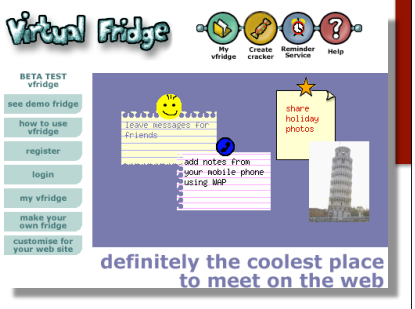
we thought differently ....

the websharer vision (1999)

" The web/Internet is not just a medium for publishing, but a potential shared place.

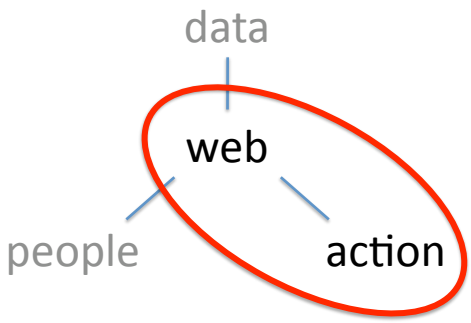
Everyone may be a web sharer — not a publisher of formal public 'content', but personal or semi-private sharing of informal 'bits and pieces' with family, friends, local community and virtual communities ..."

sounds prescient (web 2.0!)
.... and was translated into a product (vfridge)



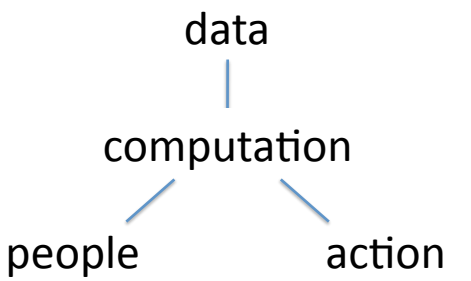
sadly the company died ☹

but the you can still play with vfridge today ☺

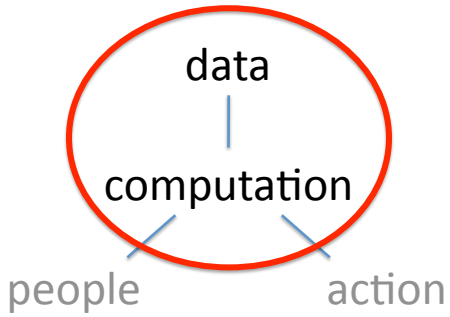


- people want to do things

Bill Gates: "*The future of search is verbs*."
Esther Dyson: " *when people search, ...*
they are looking for action"

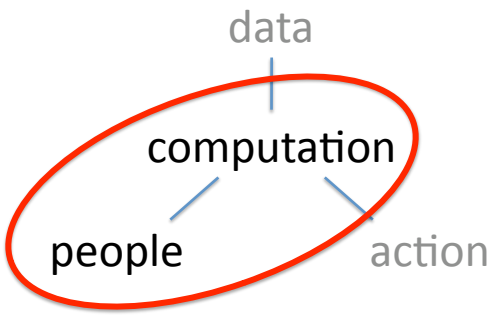


but must not forget
that at the heart of the web
is computation

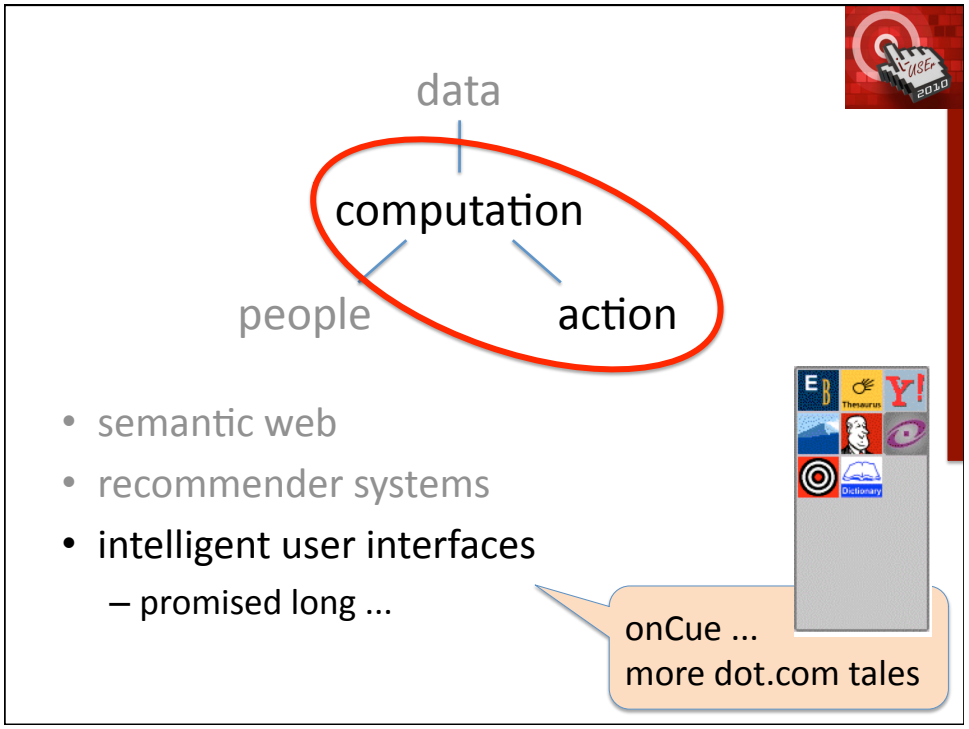


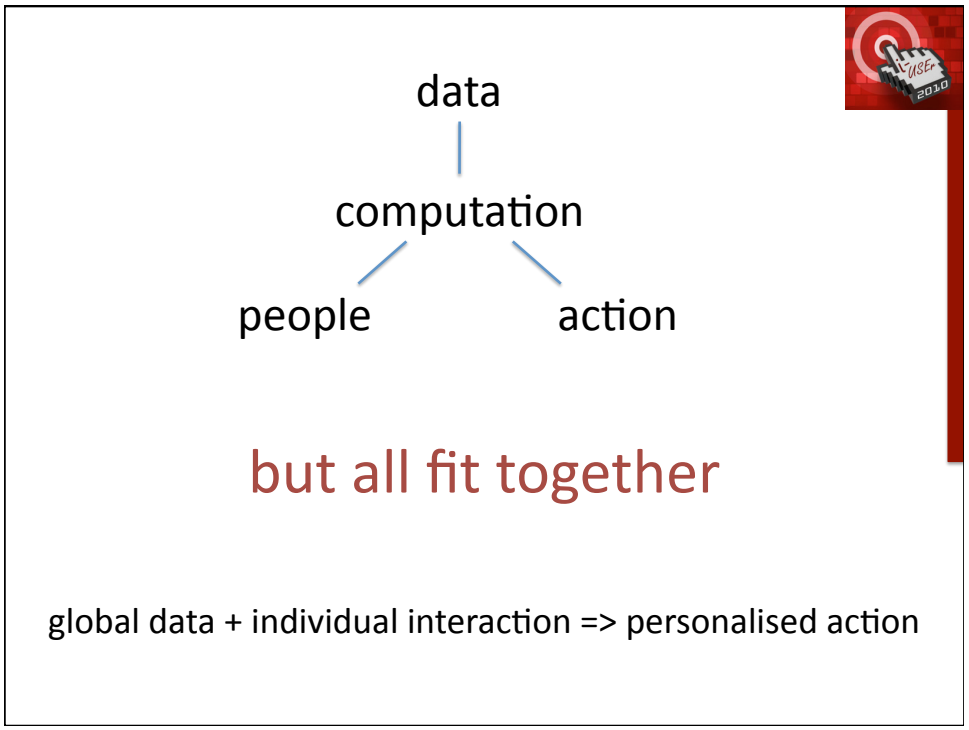
- semantic web
  - RDF, OWL etc, open data, linked data, data.gov.uk

talis



- semantic web
- recommender systems
  - Amazon for books, but now ubiquitous


data
computation
people
action
• semantic web
• recommender systems
• intelligent user interfaces
– promised long ...
onCue ...
more dot.com tales


data
computation
people
action
but all fit together
global data + individual interaction => personalised action

focusing on action

how can the system help?

time to act

- when to act (initiating action)
  - detecting loci of action in current activity
- what to act on (performing action)
  - suggesting parameters/values in actions
- how to act (continuing action)
  - proposing future actions

when to act

detecting loci of action in current activity

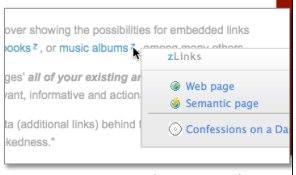
data-driven interaction

identify loci at point of creation

offer alternative RDF or XML formats

or use markup in web page

- dedicated markup
  - e.g. zLinks
- microformats
  - human readable text ...
    - ... but also machine readable for search engines or plug-ins



zitgist.com/products/zlinks

```
<p class="vcard">Hi, my name is <span class="fn">Jamie
Jones</span> and I dig microformats!</p>
```

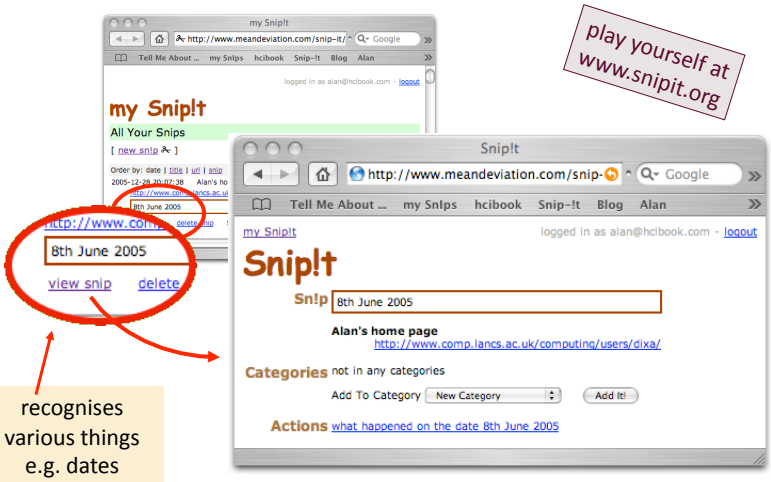
microformats.org

identify loci at point of use – Snip!t

users selects in web page and presses "Snip!t" bookmarklet

Snip!t pops up page with suggested things to do with the snip (and saves it for later, like bookmark)

identify loci at point of use – Snip!t

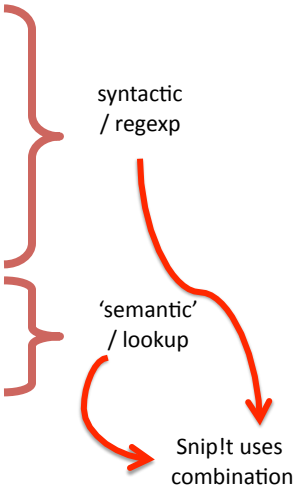


play yourself at www.snipit.org

recognises various things e.g. dates

class of systems 'data detectors'

- late 1990s
  - Intel selection recognition agent
  - Apple Data Detectors (Bonnie Nardi)
  - CyberDesk (Andy Wood led to onCue)
- recently
  - Microsoft SmartTags
  - Google extensions
  - Citrine – clipboard converter
  - CREO system (Faaberg, 2006)
- way back
  - Microcosm (Hypertext external linkage)



architecture

Snip!t – server-side 'intelligence'

(onCue – was client-side – internet speed at the time!)

recognisers + services (inherited from onCue):

- recognisers:
  - scan text for potential data
- services:
  - match data to actions

architecture

representation vs. semantics very important

simple recognisers

- regular expressions, table lookup
  e.g. postcodes, personal names from census data

different kinds of recogniser chaining:

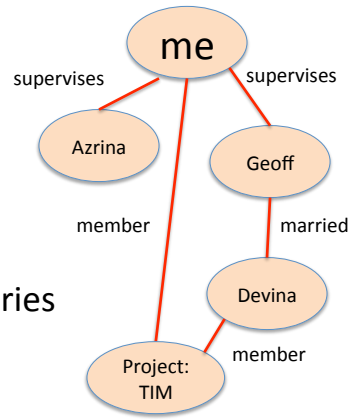
- from semantics to wider representation
  e.g. postcode suggests look for address
- from semantic to semantic
  e.g. domain name in URL
- from semantic to inner representation
  e.g. from Amazon author URL to author name

what to act on

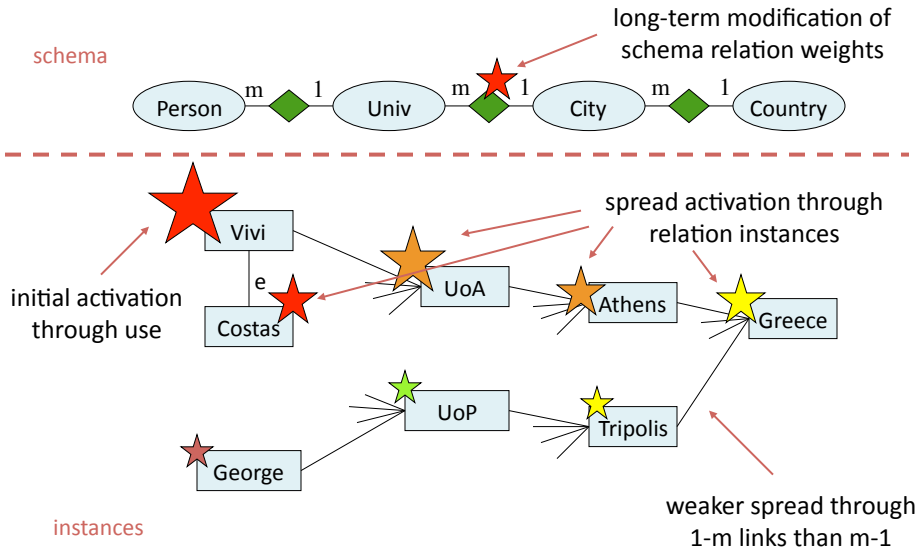
suggesting parameters/values in actions

personal ontologies

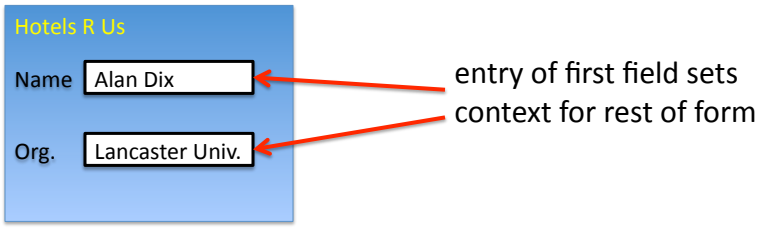
- all use 'general' categories:
  - post code, name, place
- linking to personal ontology
  - users own entities and categories
- how to build?
  - by hand (during useful interactions)
  - automatically (mining files, emails, etc.)
    - e.g. Gnowsis and other semantic desktop projects



spreading activation over ontology



context in forms



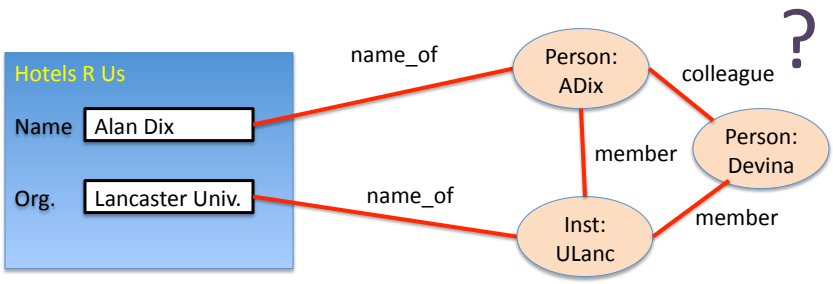
but what is the relationship?

maybe semantic markup on form

– good SemWeb style ... but not very personal

... or more inference ...

context in forms - inference

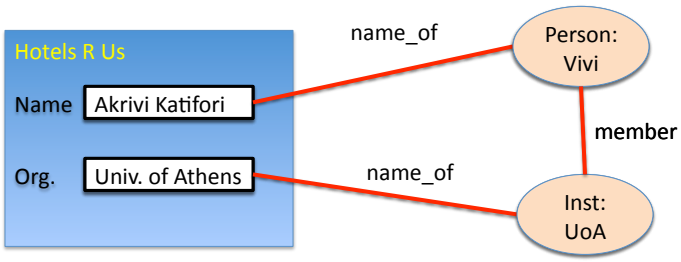


match terms in form to ontology

look for 'least cost paths'

- number of relationships traversed, fan-out

context in forms - inference



match terms in form to ontology

look for 'least cost paths'

- number of relationships traversed, fan-out

later suggest based on rules

how to act

proposing future actions

single step – next action

seen it already ...

- markup or data detectors -> loci
- find web services that use the data
- strongly typed data is the link

locating web services for data type

many web services designed for human use

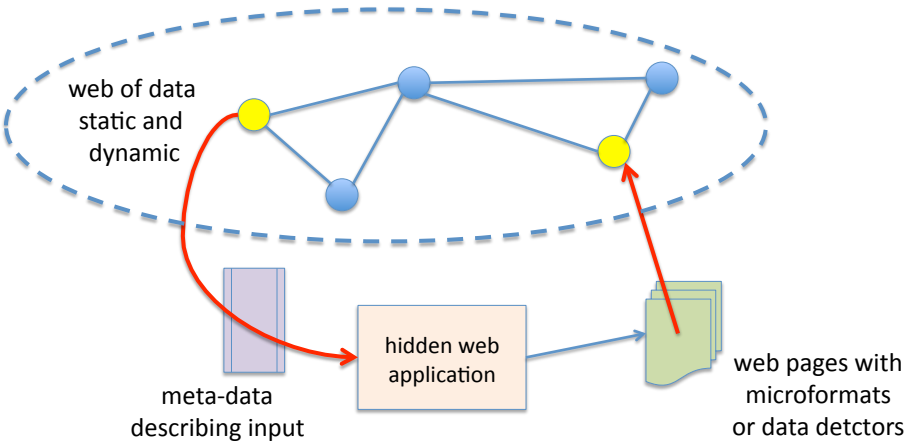
add meta-information to services

- internal (semantic page markup)
- external (e.g. Snipit, Milan Search Computing)

```
<urlservice>
  <type>name</type>
  <title>switchboard.com</title>
  <descpattern>lookup US person $name at switchboard.com</descpattern>
  <urlpattern>http://www.switchboard.com/bin/cgiqa.dll?
SR=&amp;MEM=1&amp;LNK=33:4&amp;F=${forename}&amp;L=${surname}</urlpattern>
</urlservice>
```

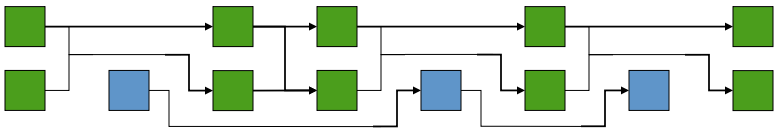
www.snipit.org

reweaving the hidden web through user interaction



proposing sequences of actions

- long history (lots of work early 1990s)
- limited success
  - interleaved tasks
  - generalisation
- data ontology helps :-)
  - input/output links like 'string of pearls'
  - ontology type allows single step learning



how to get links?

- user interaction:
  - drill-down from previous values
- system inference:
  - same form-field linking as before

so what?